

### **REMARKS**

This is a full and timely response to the Office Action mailed July 10, 2008, submitted concurrently with a Request for Continued Examination and a three month extension of time to extend the due date for response to January 10, 2009.

By this Amendment, claims 1-19 and 21-24 have been amended to more particularly define the present invention. Further, new claim 32 has been added to further protect a specific embodiment of the present invention. Thus, claims 1-19 and 21-32 are currently pending in this application. Support for the claim amendments and new claim can be readily found variously throughout the specification and the original claims (see, in particular, paragraph [0070] of the specification).

In view of these amendments, Applicant believes that all pending claims are in condition for allowance. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

### **Rejection under 35 U.S.C. §103**

Claims 1-19 and 21-31 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over WO 03/097347 in view of JP 10-045438, JP 2000-319044, JP 09-156967, JP 07-097240 and JP 05-104687. Applicant respectfully traverses this rejection.

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Further, the prior art reference(s) in combination must teach or suggest all the claim limitations. Here, in this case, Applicant believes that WO 03/097347, in combination with JP 10-045438, JP 2000-319044, JP 09-156967, JP 07-097240 and JP 05-104687, fails to teach or suggest all the limitations of the claims with particular emphasis on the limitations “*the plasticizer content of the second polyvinyl acetal resin layer (A) is generally in the range of 30-45 parts by weight, the plasticizer content of the second polyvinyl acetal resin layer (B) is generally in the range of 10-40 parts by weight*”, and “*the plasticizer content (A)/plasticizer content (B) is in the range of 1.0-3, wherein the plasticizer content*

*(A) is a plasticizer content of the first polyvinyl acetal resin layer (A) and the plasticizer content (B) is a plasticizer content of the second polyvinyl acetal resin layer (B)”.*

The Examiner has found Applicant's response of March 25, 2008 to be unpersuasive since the Examiner fails to see the unexpected results regarding the amount of plasticizer in the present invention (which Applicant has argued is not taught or suggested in the cited references). Applicant disagrees with the Examiner's position and wishes to clarify the Examiner's understanding in this regard. WO 03/097347 discloses a laminated glass which includes a thermoplastic resin sheet having an inner PVB (polyvinyl butyral resin) layer interposed between outer PVB layers. The outer layers are rendered higher in plasticizer content than the inner layer to increase the strength of the inner layer and thereby improve the mechanical strength of the laminated glass.

However, a typical thermoplastic resin sheet generally shows temperature dependence. When exposed to a low temperature, the thermoplastic resin exhibits a high maximum stress and a low elongation and thus becomes brittle. In contrast, when exposed to a high temperature, it exhibits a high elongation and a low maximum stress and thus becomes too soft. In either case, the impact resistance of a typical thermoplastic resin sheet is low. Consistent with the characteristics of a typical thermoplastic resin sheet, the laminated glass constructions described in WO 03/097347 have a drawback in that its thermoplastic resin sheet exhibits insufficient impact resistance particularly in a low temperature range. In other words, the laminated glasses described in WO 03/097347 do not possess good penetration resistance over an entire wide temperature range encompassing low and high temperatures.

In addition, it must be emphasized that in the configurations described in WO 03/097347, the inner and outer layers are all composed of the same resin, PVB. Thus, the mechanical strength of the inner layer is only rendered relatively high simply by differentiating plasticizer contents. However, such a configuration does not address the problems of insufficient impact resistance particularly in the low temperature range associated with the thermoplastic resin sheet of WO 03/097347.

In support, Figure 1 of the present drawings provides a schematic graph which explains the different actions of the thermoplastic resin sheet of the present invention and that of WO 03/097347. Solid line A of Figure 1 shows a result for a laminated glass using a typical

thermoplastic resin sheet, as an intermediate film, which comprises a PVB single layer obtained via acetalization of polyvinyl alcohol using butyraldehyde alone. Broken line B of Figure 1 shows an exemplary penetration resistance for a laminated glass in which an inner layer portion of a structure comprised of the aforementioned PVB single layer sheet was replaced with a PVB layer made relatively harder by reducing its plasticizer content, such as that described in WO 03/097347. As apparent from the comparison between the solid line A and the broken line B, the provision of the inner layer comprising the PVB layer having a lower plasticizer content increases the maximum value of penetration resistance. However, the temperature dependence of penetration resistance shifts toward a higher temperature region. As a result, the penetration resistance improves at high temperatures but drastically drops at low temperatures. (Please review Figure 1 and paragraph [0088] of the specification)

In contrast to WO 03/097347, the use of the thermoplastic resin sheet of the present invention not only increases a maximum penetration resistance but also enables the laminated glass to exhibit good penetration resistance over a wide temperature range, as shown in the solid line C of Figure 1. This is because a polyvinyl acetal resin either in the form of the coacetalized product containing certain proportions of the polymer units (X) and (Y) or in the form of the acetalized product containing the polymer unit (Y) alone is used to constitute the inner layer.

Further, in addition to using aldehyde (a) (i.e. aldehydes having 4-6 carbon atoms) which has a large molecular structure and when acetalized, provides greater steric hindrance, the present invention uses aldehyde (b) (i.e. aldehydes having 1-3 carbon atoms) which is less sterically hindering than aldehyde (a). It is believed that this shortens the distance between molecules and strengthens the intermolecular force so that the resulting resin exhibits improved rigidity compared to acetal resins produced using aldehyde (a) alone. Also, because the polyvinyl acetal resin (B) has features described in the claims (i.e. *where the molar ratio of the polymer unit (Y) to the polymer unit (X) in the polyvinyl acetal resin (B) is small*), the polyvinyl acetal resin layer (B), despite of its higher plasticizer content, can be rendered more rigid than the polyvinyl acetal resin (A). Also, because the polyvinyl acetal resin can increase its plasticizer content without a loss of rigidity (as discussed above and presented in the claims), improved impact resistance can be achieved over a wide temperature range, especially over a range from a low temperature region to an ordinary

temperature region, which the conventional PVB resin such as that disclosed in WO 03/097347 can never accomplish. (Please review Figure 1 and paragraphs [0089] and [0090] of the specification).

Applicant believes that since the claimed resin layer containing the co-acetalized resin and the ranges of the plasticizer content in the co-acetalized resins are not disclosed or suggested in WO 03/097347 in combination with the other cited references JP 10-045438, JP 2000-319044, JP 09-156967, JP 07-097240 and JP 05-104687, such features of the present invention (i.e. improved impact resistance over a wide temperature range) cannot be expected based on the teachings and suggestion of the cited references. As the Examiner already knows, a showing of superior and unexpected properties can rebut a *prima facie* case of obviousness. *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963).

In support, Applicant intends to provide additional experimental data showing that the unexpected superior effects (i.e. *high penetration resistance in a high temperature region*) of the present invention cannot be obtained in any of these cited references as shown in a following Table A.

Prior Art		PENETRATION RESISTANCE				
		0°C	10°C	20°C	30°C	40°C
1)JP 10-045438	Example 2	5.6	5.6	5.5	3.7	2.2
2)JP 2000-319044	Example 1	5.6	5.6	5.6	3.8	2.3
3)JP 09-156967	Example 1	6.0	6.1	6.0	4.0	2.5
4)JP 07-097240	Example 1	5.7	5.9	5.8	3.9	2.2
5)JP 05-104687	Example 2	5.7	5.7	5.3	3.5	2.0

As shown in Table A, all of the intermediate sheets in the cited references show a lower penetration resistance at a temperature of 30°C or 40°C as compared to the temperature of 0°C to 20°C.

In contrast, in the present invention, the penetration resistance is not lowered over the whole temperature range of 0°C to 40°C as shown in Examples 1 to 18 in Tables 8 and 9 of the specification.

To further demonstrate the above, Applicant will be providing additional experimental data in a Rule 1.132 Declaration which will be filed in the near future. Applicant notes that the additional experimental data will not compare the penetration resistances of WO 03/097347 and the present invention since they are not comparable for the reasons already outlined above. In WO

03/097347, a very thick intermediate sheet having a thickness of 2.54 mm is used, which makes it not comparable with any of the Examples in the present invention. Applicant believes that the differences between WO 03/097347 and the present invention, particularly with regards to the differences in the penetration resistance in a broad temperature range, have already been clearly explained in the remark above.

In addition, as previously noted in the response filed March 25, 2008, the laminate including the PVB layer containing not more than 50 parts by weight of the plasticizer is not disclosed in the cited references, JP 10-045438, JP 2000-319044, JP 09-156967, JP 07-097240 and JP 05-104687. For the Examiner's reference and convenience, Applicant has outlined the plasticizer contents in the cited references in the table below.

	Content of Plasticizer in Resin Layer (A)
JP'438	50 Parts by Weight in All Examples
JP'044	50 Parts by Weight in Examples 1-4 * Examples 5 and 6 use butyl aldehyde (number of carbon atoms: 4)
JP'967	50 Parts by Weight in Example 2
JP'240	50 Parts by Weight in All Examples
JP'687	Using Octyl aldehyde (number of carbon atoms: 8)

Thus, it is respectfully submitted that none of the applied art, alone or in combination, teaches or suggests all the limitations and superior features of the claims as described above. Further, it is respectfully submitted that one of ordinary skill in the art would not be motivated to combine the features of the applied art because such combination would not result in the claimed invention. As a result, it is respectfully submitted that claim 1-4 is allowable over the applied art.

Claims 5-19 and 21-32 depend directly or indirectly from claim 1 and includes all of the features of claim 1. Thus, it is respectfully submitted that the dependent claims are allowable at least for the reasons claim 1 is allowable as well as for the features they recite. Thus, withdrawal of the rejection is respectfully requested.


Further, Applicant asserts that there are also reasons other than those set forth above why the pending claims are patentable. Applicants hereby reserve the right to submit those other reasons and to argue for the patentability of claims not explicitly addressed herein in future papers.

### CONCLUSION

For the foregoing reasons, all the claims now pending in the present application are believed to be clearly patentable over the outstanding rejections. Accordingly, favorable reconsideration of the claims in light of the above remarks is courteously solicited. If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

Dated: December 31, 2008

Respectfully submitted,

By:  \_\_\_\_\_

Lee Cheng

Registration No.: 40,949

CHENG LAW GROUP PLLC

1100 17th Street, N.W.

Suite 503

Washington, DC 20036

(202) 530-1280

Attorneys for Applicant

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